



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Nondestructive Evaluation

WELDENG 4301

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

Main concepts of Nondestructive Evaluation of materials as applied to inspections of joints and structures; principles of conventional methods and their capabilities and limitations.

Prerequisites and Co-requisites:

Prereq: 4201, and enrollment as a WeldEng-BS major; or permission of instructor.

Course Goals / Objectives:

- Achieve basic understanding of main concepts and aims of nondestructive evaluation (NDE)
 - Learn theoretical principles of NDE methods and their capabilities and limitations
 - Learn applications of nondestructive material evaluation.
 - Learn to apply NDE for joint inspections
 - Obtain some basic laboratory experience with nondestructive evaluation methods
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Course Topics:

- Introduction to NDE.
 - Introduction to Ultrasonic Testing.
 - Physical Principles of Ultrasonic.
 - Reflection and transmission of ultrasonic waves.
 - Ultrasonic Transducers. Ultrasonic laboratory.
 - Ultrasonic testing methods. Laboratory.
 - Introduction to radiography.
 - Generation of X-rays.
 - Radiation attenuation.
 - X-Ray Films.
 - Selection of Exposure Parameters. Radiography laboratory.
 - Factors affecting quality of radiographs .
 - Image quality indicators.
 - Radiographs of welds and different radiographic techniques.
 - Gamma Rays
 - Real-Time Radiography
 - Magnetic particle testing fundamentals.
 - Physical principles of magnetization and inspection. Magnetic particle testing laboratory.
 - Liquid penetrant testing. Liquid penetrant testing laboratory.
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Designation:

Required